

**What Makes a High-risk Athlete? A Quantitative study of the Individual Differences of High-risk and Low-risk Athletes.**

Oran O'Kelly  
Student Number:12505567

Submitted in partial fulfillment of the requirements of the BA Hons in Psychology at The National College of Ireland, School of Business, Dublin.

*Supervisor:* Dr. Arlene Egan  
Head of Department: Dr. Grace O'Malley

March 2015  
Department of Psychology  
National College of Ireland



## TABLE OF CONTENTS

Acknowledgements .....	5
Abstract .....	6
1. Introduction.....	7
1.1. Personality.....	8
1.2. Mental Toughness .....	10
1.3. Optimism .....	12
1.5. Coping Strategies in Sport.....	15
1.6. Sensation-Seeking .....	17
1.7. The Influences of Age and Gender on Risk-Taking .....	17
1.8. Conclusions .....	18
1.9. Study Aims and Hypotheses .....	19
2. Methods .....	21
2.1. Study Design and Research Setting.....	21
2.2. Pilot Study .....	22
2.3. Participants.....	22
2.4. Materials .....	24
2.5. Measures.....	24
2.5.1. Mini- International Personality Item Pool Scale.....	24
2.5.2. Sports Mental Toughness Questionnaire.....	25
2.5.3. Achievement Motives Scale—Sport.....	25
2.5.4. Coping Strategies in Sport Competition Inventory.....	25
2.5.5. The Life Orientation Test - Revised .....	26
2.5.6. Impulsivity, Risk-Taking, and Sensation-Seeking Scale.....	26
2.6 Statistical analysis.....	27
3. Results.....	28
3.1. Participant Characteristics .....	28
3.2. Inferential Statistics .....	31
3.2.2. Mental Toughness.....	32
3.2.3. Life Orientation.....	32
3.2.4. Achievement Motivation .....	33
3.2.5. Coping Strategies .....	33
3.2.6. Risk-Taking, Impulsivity, and Sensation-Seeking.....	34
3.2.7. The Impact of Age and Gender on Risk Level.....	34
4. Discussion.....	35
4.3. Implications and Possible Applications .....	40

4.4. Future Research Directions .....	40
References .....	43
Appendix	44

# **Acknowledgements**

I would like to take the opportunity to thank Dr. Arlene Egan who provided me with supervision, support, guidance and direction through the research process for this study.

I would also like to thank my dog, Laith for the unconditional emotional support and encouragement of effective time management.

# Abstract

Investigated were the individual differences of a diverse sample of 216 athletes. The main aim of the study was to assess the level of differences between the two groups of risk level athletes comparing results scored on several dimensions. Sample consisted of 110 high-risk athletes and 106 low-risk athletes, measured using the scales of IPIP Personality, Sports Mental Toughness, Life Orientation, Achievement Motives, Coping Inventory, Impulsivity, Risk-taking and Sensation Seeking. It was found that high-risk athletes scored higher in levels of age, neuroticism, confidence, risk-taking and sensation seeking. Where low-risk athletes scored higher in levels of control, distraction-oriented and disengagement-orientated. This supports and contradicts previous literature. Limitations of the present study and suggestions for future research are also discussed.

# 1. Introduction

Since 1907, more than 200 lives have been lost participating in the Isle of Man Tourist Trophy, a motorcycle racing event held on the Isle of Man each year (Cary, 2014). This event takes place on closed public roads and claims an average of 1.5 lives each year. Fully aware of the risks, these athletes remain focused and perform to their best abilities. This is just one of the many sporting activities that continue to take place today with participating athletes accepting the possibility of serious injury or death. Among youth athletes, there were 40 sport-related deaths in 2011, with nearly 200 dying in the previous three years. Participation in sports can be linked to traumatic brain injuries, sudden cardiac arrest, and spinal injuries, all of which can kill or severely cripple a person (YSSA, 2014). So who are the athletes who participate in these risky activities? Personality characteristics might be one predicting factor, and this study will examine several.

Participation in high-risk activities is evident throughout history, dating from hunter-gatherer cultures when humans who took on the risk of hunting larger animals were rewarded with better mating and reproductive opportunities (Stelmack et al., 2004). The concept of risk varies significantly by context, and can include mental, physical, legal, economic, and social risks. For example, the Prospect Theory of risk (Kahneman & Tversky, 1979) suggests that people are risk-averse when faced with an opportunity to make a gain but risk-seeking when faced with the prospect of a loss (Levy et al., 1997). Focusing on participation in sporting activities, Breivik (1995) defines a high-risk sport as ‘any sport, where one has to accept a possibility of severe injury or death as an inherent part of the activity’. Interestingly, during the first half of the century, physical risk-taking behaviour was

widely accepted as strong evidence of mental pathology (Huberman et al., 1968), while today, risky behaviour has been demonstrated to be an attractive trait in romantic partner selection (Henderson et al., 2005).

Research generally uses the term “high-risk sports”, but expressions such as “extreme” or “adrenaline” sporting activities are also commonly used. High-risk sporting activities are a well-accepted part of our society, each originating at different times, but still currently very popular, and the number of participants in these sports is continuously rising (Shoham et Al., 2000). High-risk sports are differentiated from other sports in that participants knowingly face the risk of a serious injury and even death in the event that their judgment or equipment fails (Lyng et al., 1990). High-risk sports include such activities as rock climbing, bungee jumping, and snowboarding, while low-risk sports such as golf, swimming, tennis, or volleyball, don't involve immediate risk of severe injury or death (Palmer et al., 2002).

The physical and mental demands made on the body during participation in high-risk sports can be severe (Rhy et al., 1988). This study aims to build upon research into personality characteristics of people who tend to be more willing to risk serious injury or death for the purpose of recreation (Cronin et al., 1991; Jack & Ronan, 1998; Marusic et al., 1998; Vollrath et al., 1999).

### **1.1. Personality**

Personality psychology has been used to develop profiles of athletes who participate in high-risk sports, producing a quantifiable method of mapping individuals who are more susceptible to engaging in high-risk sporting activities.

Personality traits are a well-developed psychological construct, and can be defined as ‘a consistent pattern of thinking, feeling and acting, that differs between people’ (Johnson, 1997). There is evidence that personality characteristics are reliable predictors of various risk-taking behaviours (Selosse, 1998). Although originally considered entirely hereditary, personality traits are influenced not only by genetics, but by developmental factors such as exposure to positive role models and structured environments (Crust & Clough, 2005). The available literature focuses primarily on risk-taking in the context of socially unacceptable behaviours such as violence .

Only a few studies have focused on personality traits in the context of high-risk sports, in which danger is recognized and risk-taking behaviours are socially acceptable (Turner et al., 2004). This oversight results in a gap in the available literature. Likewise, recent publications focus primarily on the traits of high-risk athletes and fail to compare them with low-risk athletes (Castanier et al., 2010), who may have significantly different characteristics. The lack of research into these potential comparisons provides a valuable opportunity to examine the influence of personality characteristics in both low- and high-risk athletes.

Neuroticism, extraversion, acceptability, conscientiousness, and intellect have all been examined in recent research in risk-taking behaviour. Low levels of conscientiousness, for example, have been found to be the most consistent personality predictor of risk-taking in high-risk sports. Research focusing solely on high-risk athletes carried out by Castanier et al. (2010) suggested that low levels were associated with high-risk sports participation, but only in the presence of high

levels of extraversion and low levels of neuroticism. This is in agreement with previous research into general risk-taking behaviours demonstrating that high levels of conscientiousness predict an inclination to refrain from such behaviours (Vollrath et al., 1999). Goma-i-Freixanet (1991) found that high-risk athletes obtained the lowest scores in neuroticism. Research carried out by Kajtna et al. (2004) into both groups as well as non-athletes found higher levels of intellect in low-risk athletes and non-athletes than in high-risk athletes. Douglas (1986) states from research in risk-taking management that levels of acceptability are directly correlated with the level of risk taken in sporting activities. The research available to date therefore suggests that participation in high-risk sporting activities is associated with higher levels of neuroticism and extraversion and lower levels of conscientiousness, acceptability, and intellect when these athletes are compared to individuals participating in low-risk sports.

## **1.2. Mental Toughness**

Mental toughness is a relatively new construct in psychology, defined by Earle and Sewell (2002) as “a high sense of self-belief and an unshakable faith that they control their own destiny”. These authors also comment that mentally tough individuals can remain relatively unaffected by competition and adversity. Although mental toughness as a construct may be relatively new, self-belief, self-efficacy, and imperviousness to competition and adversity are characteristics that have long been associated with better higher performance in various activities (Cattell, 1957). However, there is still much debate in recent research about whether mental toughness should be defined as a personality trait or a mindset (Crust & Clough, 2011).

The scientific study of mental toughness has occurred primarily within the context of sports psychology (Gucciardi & Gordon, 2011). It is a crucial psychological attribute in explaining differences in athletic performance, particularly in relation to elite athletes (Crust, 2008; Nicholls et al., 2009). It is one of the most commonly used phrases in this area of research, yet there is little understanding of the concept (Jones et al., 2002). An exploratory study carried out with elite athletes from 31 different sports found twelve components of mental toughness (Fourie & Potgieter, 2001): motivation level, coping skills, confidence maintenance, cognitive skill, discipline and goal-directedness, competitiveness, possession of prerequisite physical and mental requirements, team unity, preparation skills, psychological hardiness, and ethics. These authors found that athletes regarded perseverance as the most important of these twelve components. More recent research into the concept has narrowed the components down to control, commitment, challenge, and confidence.

In recent literature, mental toughness is generally measured using the Sports Mental Toughness Questionnaire (SMTQ) (Sheard et al, 2009). When measuring these components using this measure, however, it is important to note that Sheard's interpretation of mental toughness is not limited to the reaction an athlete has in adverse situations, but rather includes the more positive psychological traits motivating an individual to excel.

Supporting previous research carried out by Levy et al. (2006), possible drawbacks have been found to being classified as mentally tough (Gould, Jackson & Finch, 1993). Mental toughness has been associated with greater pain tolerance and a

lower probability of completing rehabilitation exercises following an injury. It has been suggested by Bull et al., (2005) that mental toughness might be specific to certain sports, the possibility of high levels of risk, or to differences between contact, team, and individual sports. Research carried out by Kaiseler et al. (2009), however, found that achievement level and type of sport were not significantly associated with mental toughness. From the literature, it would be rational to suggest that higher levels of mental toughness may be correlated with high-risk sports participation, possibly due to the significant demands of these sports.

### **1.3. Optimism**

Optimism, which can be defined as general positive expectations for the future (Andersson, 1996), is mainly associated with beneficial effects regardless of context, including health, work, school or sport contexts (Regourd-Laizeau et al., 2012). The concept has therefore been studied in detail to examine its influence on human behaviour. For example, Andersson (1996) found that individuals with higher levels of optimism reported less distress in a wide variety of situations, especially situations considered stressful. As such an influencing factor in situations of daily life, optimism can have significant effects on one's behaviour and opportunities. Madrzycki (1996), for example, reported that in difficult situations, pessimists focused mainly on their own emotional response, while optimists focused on plans of action to solve the problem on hand.

Optimism has also long been associated with rationalizing beliefs of potentially harmful risk-taking behaviours (Dillard et al., 2006). A study into the generally high levels of optimism among young males by Little (2006) found optimism to be a

contributory factor in accidental injury, which in turn is the leading cause of death in childhood years. In the context of sport, elite level athletes have been characterised by their peers as highly optimistic and highly able to thrive in situations of great pressure (Connaughton et al., 2008). Optimistic athletes report competing more out of hope of victory than fear of losing, even when experiencing loss, they consider reason due to controllable circumstances rather than inability (Goleman, 1998).

Gordon (2007) found that in both team and individual sports, high athletic achievement was driven by attribution-style optimists who were considered extreme optimists. Meta-analytical findings of Nes & Segerstrom (2006) indicate that athlete optimists adjust their coping strategies to meet the specific demands of stressors on hand and generally cope more effectively. There is a gap in the research of optimism levels in the context of risk-taking in sport; because high-risk athletes are required to cope with higher-stake situations, it would be expected that they would report higher levels of optimism than would low-risk athletes.

#### **1.4. Achievement Motivation**

Motivation is the driving force behind all actions of an individual; the influence of an individual's desires and needs shapes their behaviour (Rabideau, 2005). The concept can be broken down into different forms of extrinsic, intrinsic, physiological, and achievement motives. The majority of goals are incentive-based, with incentives ranging in complexity and including hunger, financial gain, compassion, ambition, and desire for personal fulfillment. Achievement motivation

is a concept of interest in this study, as it is based on the way in which an individual performs on reaching success (Harackiewicz et al., 1997).

Intrinsic motivation is defined as a motivation that comes from within the person and his or her own values and beliefs rather than from an external stimulus such as profit or social recognition. Because the person wants to achieve something, he or she works to reach the goal (Ryan & Deci, 2000). Intrinsic motivation is a key aspect of sport participation. People engage in sports because they want something, so understanding motivation can help researchers to understand why people choose to engage in high-risk activities. Intrinsic motivation applied to high-risk sports can be divided into two types: motivation to experience stimulation, as high-risk sports can be linked to new, pleasurable, or exciting sensory experiences; and motivation to accomplish goals (Vallerand, 2004).

Achievement motivation is defined as the orientation to action due to an objective to reach certain standards. This motivation is expressed as progress towards a goal, so an individual with this type of motivation will usually place their energy and effort into achieving what they want. It is clear that this type of motivation is important in high-risk sports, as athletes want to improve themselves to reach a certain standard, by competing, for instance, or simply becoming better at the sport. Participation in extreme sports may also bring a higher level of satisfaction and achievement, as they are more risky and challenging, and less open to everyone, so people who master them may feel that they have achieved more than if they had mastered a low-risk sport (Willig, 2008). In a qualitative interview-based study of motivation in high-risk sports, Slinger et al. (1997) reported that 85% of the participants in the

higher-risk groups identified a desire for achievement. In this study, it will be proposed that athletes who participate in high-risk sports have a higher level of achievement motivation, and are therefore more driven to accomplish goals and improve than athletes involved in low-risk sports.

### **1.5. Coping Strategies in Sport**

An athlete's psychological response to competition is believed to depend on the characteristics and requirements of the sport (Krane & Williams, 1987); each sport is unique in this manner. Coping is defined as the behavioural and cognitive efforts of an individual to manage internal and external demands of a specific stress-inducing situation (Lazarus and Folkman, 1984), such as the stimuli presented in the context of high-risk sport participation. Researchers have gathered data regarding athletes' coping behaviours and have begun to identify how athletes cope under various sport-related conditions (Crocker, 1992). However, there is still a lack of significant findings about coping and sporting achievement (Hoar et al., 2006).

There are two approaches in the literature to the process of coping. The first, the process-oriented approach of coping (Lazarus & Folkman, 1984), is comprised of two dimensions: task-oriented and disengagement-oriented coping (Skinner et al., 2003). The second, the episodic process model of human performance (Beal et al., 2005), centers on episodes of "naturally segmented relatively short episodes thematically organized around work-relevant immediate goals or desired end states". However, recent research has found the process-oriented approach to be more useful in understanding the transient self-regulatory factors associated with within-person variations in athletic achievement (Gaudreau et al., 2010). A review

carried out by Nicholls and Polman (2007) revealed that over 80% of the studies into coping in sport were strongly influenced by the process-oriented model of coping.

The most accepted measure of assessing levels of coping in athletes is the Coping Strategies in Sport Competition Inventory (ISCCS) scale developed by Gaudrea and Blondin (2002). The three second-order dimensions measured by this questionnaire are task-oriented coping, distraction-oriented coping, and disengagement-oriented coping. Task-oriented coping refers to taking action in situations that are stressful. The athlete begins to move towards the desired goals by changing or modifying the source of stress. Emotion-focused coping involves regulating distress and decreasing negative emotions, and disengagement-oriented coping involves avoiding the stressful situation entirely (Grove & Heard, 1997). Research using this scale has found that athletes using a high level of task-oriented coping in combination with a low level of disengagement-oriented coping reported better goal and psychological adjustment (Gaudrea & Blondin, 2004). Problem-focused coping has also been associated with higher levels of mental toughness, but lower levels of emotion-focused and avoidance coping (Kaiseler et al. 2009).

There is insufficient research into the coping techniques of specifically high-risk athletes, and the studies available primarily focus on the element of injury (Junge, 2000). From the available research, it can be hypothesized that high-risk athletes will score significantly higher in levels of coping as the level of stress involved in high-risk activities is higher.

## **1.6. Sensation-Seeking**

Sensation-seeking has become synonymous with risk-taking in sport (Ferrando & Chico, 2001). However, this is not limited to risk-taking in sporting activities alone; it is also evident in participation in a wide range of activities. Zuckerman's (1994) definition of sensation-seeking is still widely used in the literature today: "the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experiences". Sport psychology research has indicated that high levels of sensation-seeking are strongly associated with participation in high-risk sport (Straub, 1982). Through the use of Zuckerman's (1979) Sensation-Seeking Scale (SSS V), this finding has been consistently reported (Jack & Ronan, 1998). Potgieter & Bisscho (1990) concluded that sensation-seeking serves as a possible underlying explanation for the motivation of many individuals to participate in high-risk sports.

Impulsivity tendencies have been found to be more related to levels of sensation-seeking in athletes than to the level of risk involved in the sporting activity (Jack & Ronan, 1998). For the purpose of this study, sensation-seeking, risk-taking, and impulsivity will be studied; these personality characteristics are all believed to be associated with higher levels of risk-taking in a sporting context (Murray, 2003).

## **1.7. The Influences of Age and Gender on Risk-Taking**

In general, men tend to engage in more risky behaviors over different domains. This is linked to different risk-assessment strategies. Women tend to focus more on negative outcomes and judge possible enjoyment as less important. Men, on the other hand, have been found to be more likely to judge risky behaviours differently and to have a higher tendency to engage in risky behaviours, such as high-risk

sports (Harris, Jenkins & Glaser, 2006). This is supported by other studies that also found that men are more likely to participate in risky sporting activities (Ristolainen, 2009).

As for age, studies have shown mixed results about whether older people are less likely to engage in risky behaviours and make risky decisions, although there are studies that do show a decrease in risky behaviours with age (Gardner et al., 2005). However, there are differences that tend to appear in proportion to the certainty of gains or losses. Older people are more likely to engage in risky behaviours if there is higher certainty of gains, and tend to prefer sure gains and avoid sure losses more than younger people (Mather et al., 2012). In high-risk sports, there is less certainty in respect to possible enjoyment or mastery. On the other hand, there are high potential losses. This may imply that older people are less likely to engage in high-risk sports than younger people, although there is little research in regard to the influence of age on high-risk sport participation (Feher et al., 1998).

Therefore, it will be predicted that higher levels of perceived risk-taking will be reported by males and by younger participants.

## **1.8. Conclusions**

This review examined the literature available on sporting athletes regarding the areas of personality, mental toughness, optimism, motivation, coping strategies, risk-taking, impulsivity and sensation seeking. Acknowledging several relationships between concepts.

Evidence suggests that high-risk athletes tend to differ in dimensions of personality. Levels of mental toughness are suggested to be higher of high-risk athletes due to the demanding nature of these sports. Little has been done to examine the element

of risk taken in sporting activities with in concepts of coping strategies, achievement motivation, optimism. Further building on and forming predictions of reports not directly linking to the relationship.

### **1.9. Study Aims and Hypotheses**

The primary aim of this study is to investigate the relationships between high-risk sports participation and personality traits, mental toughness, optimism, motivation, coping, sensation-seeking, risk-taking, and impulsivity. The study will also examine the potential influences of age, sex, education, experience, level of competition, and level of believed risk taken. The findings from this study should add to the available literature regarding psychological characteristics that are predictive of individual participation in high-risk sports, and identifying differences between the two groups could help in the development of coaching strategies and support services available for athletes. To these ends, the seven hypotheses for this study are that:

1. Athletes participating in high-risk sports will demonstrate significantly higher levels of mental toughness than will low-risk athletes.
2. High-risk athletes will demonstrate significantly higher levels of neuroticism and extraversion and significantly lower levels of conscientiousness and acceptability as compared to low-risk athletes.
3. High-risk athletes will report higher levels of optimism.
4. High-risk athletes will report significantly higher levels of achievement motivation.
5. High-risk athletes will score significantly higher in all levels of coping.

6. High-risk athletes will demonstrate significantly higher levels of risk-taking and sensation-seeking than will low-risk athletes.

High-risk athletes are more likely to be younger or male.

## 2. Methods

### 2.1. Study Design and Research Setting

This is a quantitative study, using a cross-section of participants. A battery of questionnaires was compiled using Google Drive and distributed to participants. Using a between-groups design to test variable scores related to the type of sport participated in, high-risk sports participation was used as a predictor variable throughout the study.

All methods and procedures were approved by the National College of Ireland Ethics Committee in accordance with the Code of Professional Ethics of the Psychological Society of Ireland, and all participants provided voluntary, informed consent. Consent was verified with a selection box on the first page of the online battery set, which was distributed to participants with the use of a hyperlink by email, social media websites, and online forums. The link was uploaded onto several websites such as Reddit, which is a gateway of online forums for entertainment, social networking, and news where members can submit content, such as text posts or direct links (Rosen, 2013). The link was also posted in specific high- and low-risk sport sub-forums. Athletes were asked to forward the link to other athletes in order to begin a snowballing effect.

The online forms were designed so that it was mandatory to answer every question on each page in order to proceed to the next question; it was also not possible to give multiple responses for a single item. Completion of the battery set was reported to take between 10 and 15 minutes. Participants were asked to create a unique

identity code in order for data to be potentially identifiable. Upon completion of the questionnaire set, all participants were thanked for time given to the study and given contact information in case of questions, suggestions, or in order to request removal of data from the study. (See appendix A) The battery was available for a total of two months from 1 November to 31 December 2014; the link then expired and access was no longer possible.

Data from the battery were automatically converted into Microsoft Excel format. Incomplete questionnaires or bugs found in the data file were removed. The Excel data file was converted into SPSS (Version 22). Recoding and screening of the data was managed, and all variables were labeled and prepared for statistical analysis. After recoding and analysis of the collected data, the dataset was encrypted and stored in a secure location.

## **2.2. Pilot Study**

A pilot study was carried out with 5 participants, in which feedback was given about completion time and overall acceptability of the questionnaires. Suggestions were made, such as splitting the battery into separate pages by measure, addition of a progression bar, more colour added, and more detail of purpose in the description; errors were pointed out, such as several repeated questions, and grammatical and spelling errors, and several data collection errors were discovered.

## **2.3. Participants**

Participants were recruited through online forums, including Reddit and various sports forums, resulting in a snowballing sample. Inclusion criteria were as follows:

at least 18 years of age, current participation in some sort of sporting activity at any level, voluntary participation, informed consent, and adequate English fluency.

Participants were also informed that results would be partly identifiable if a participant requested that his/her data be removed, but not directly linked or associated with any individual participant in reported results. The sample consisted of 219 athletes, including 189 males and 27 females ranging in age from 18 to 57 years (mean =24.03, SD=6.55). Participants originated from 19 countries: U.S.A (129), Canada (28), U.K. (19), Ireland (10), Australia (9), Germany (4), Netherlands (3), U.A.E (2), Portugal (2), Belgium (1), France (2), South Korea (1), Slovakia (1), Sweden (1), Norway (1), China (1), Paraguay (1), Finland (1), Switzerland (1), and Panama (1). Participant demographics are summarised in Table 1.

**Table 1: Demographic characteristics of participants**

	All (n=216)		Low-risk (n= 106)		High-risk (n= 110)	
	N	%	N	%	N	%
<b>Age</b>						
18-20	51	23.6	35	33	16	1
20-29	135	62.5	61	57.5	74	67.3
30-39	24	11.1	8	7.7	16	14.5
40-49	3	1.3	1	.9	2	1.8
50+	5	2	3	.9	2	1.8
<b>Sex</b>						
Male	189	87.1	13	12.3	96	87.3
Female	27	12.4	93	87.7	14	12.7
<b>Education</b>						
Did not complete secondary school	20	9.2	16	15.1	4	3.6
Secondary school	86	39.6	45	42.5	41	37.3
Bachelor's Degree	82	37.8	32	30.2	50	45.5
Master's Degree	21	9.7	10	9.4	11	10
Doctoral Degree	7	3.2	3	2.8	4	3.6
<b>Years of Sport Participation</b>						

0-1	36	16.7	9	8.5	27	24.8
2-5	90	41.9	45	42.5	42	38.5
6-9	34	15.8	18	17	16	14.7
10+	48	25.6	31	29.2	24	22

## **2.4. Materials**

Materials included access to a computer with internet connection, email, social media, and online forums, Google Drive, and the questionnaires listed and described below.

## **2.5. Measures**

The first part of the questionnaire battery consisted of a brief demographic data collection form, requiring a participant's age, sex, country, sport participated in, experience, level of competition, level of achievement, and perceived risk taken.

### **2.5.1. Mini- International Personality Item Pool Scale**

The Mini International Personality Item Pool Scale (Mini-IPIP) is a brief self-report questionnaire designed by Donnellan et al. (2006) to assess the Big Five personality traits (extraversion, agreeableness, conscientiousness, neuroticism, and intellect) (see Appendix B). The measure consists of 20 items, and each trait is assessed by 4 items. Participants rate to what degree each item describes them using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). This measure contains several reversed items (e.g. 'Am not interested in other people's problems'). The Mini-IPIP has displayed good test-retest reliability and convergent, discriminant, and criterion-related validities in previous studies (Donnellan et al., 2006; Cooper et al., 2010).

### **2.5.2. Sports Mental Toughness Questionnaire**

In order to measure mental toughness, the Sports Mental Toughness Questionnaire (SMTQ) (Sheard et al., 2009) (see Appendix C) was used. The SMTQ is a 14-item self-report questionnaire consisting of three subscales: confidence, constancy, and control. It is a multi-dimensional measure developed from previously published qualitative mental toughness studies. Respondents are asked to rate each item on a 4-point Likert scale ranging from 1 (not at all true) to 4 (very true). Exploratory and confirmatory factor analysis of this measure has found acceptable Cronbach's alphas for each factor: confidence = 0.79, control = 0.72, and constancy = 0.76 (Kline et al., 2005). Sheard et al. (2009) have also provided evidence of the structure, reliability, and validity of this measure.

### **2.5.3. Achievement Motives Scale—Sport**

Specifically designed for a sports context, the Achievement Motives Scale—Sport (AMS-S) (Elbe et al., 2005) is a 15-item self-report questionnaire that uses a 4-point Likert scale ranging from 1 (not true for me at all) to 4 (exactly true for me) (see Appendix D). In order to calculate overall Net Hope when scoring, a participant's Fear of Failure score is subtracted from his or her Hope of Success score.

Cronbach's alphas have been reported for both factors: Hope of Success = 0.92 and Fear of Failure = 0.93. Retest reliability levels have also been reported: Hope of Success = 0.71 and Fear of Failure = 0.69 (Wenhold et al., 2005).

### **2.5.4. Coping Strategies in Sport Competition Inventory**

Coping was assessed as a multidimensional construct using the Coping Inventory for Competitive Sport (CICS) (Gaudrea & Blondin, 2002). This 39-item

questionnaire measures ten coping styles categorised into three second-order subscales: task-oriented coping, distraction-oriented coping, and disengagement-oriented coping (see Appendix E). Participants are asked to record their responses using a 5-point Likert scale ranging from 1 (does not correspond at all to what I did or thought) to 5 (corresponds very strongly to what I did or thought). The task-oriented coping subscale includes coping strategies, thought control, mental imagery, relaxation, effort expenditure, logical analysis, and seeking support (e.g. “I tried to relax my body”). The distraction-oriented subscale includes distancing and mental distraction (e.g. “I kept all competitors at a distance”). The disengagement-oriented subscale includes disengagement/resignation and venting (e.g. “I lost all hope of achieving my goal”). Strong reliability and validity have been reported for the CICS with a Cronbach’s alpha of 0.87 (Gaudreau & Blondin, 2002).

#### **2.5.5. The Life Orientation Test - Revised**

The Life Orientation Test - Revised (LOT-R) (Scheier et al., 1994) was chosen in order to assess the participants’ optimism and pessimism (see Appendix F). This questionnaire is a 10-item version of The Life Orientation Test (LOT) and consists of four positively worded items measuring optimism, four negatively worded items measuring pessimism, and four filler items. Participants are asked to record responses according to a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The reliability and validity of the measure were reported with a Cronbach’s alpha of 0.69 by Hirsch et al. (2010).

#### **2.5.6. Impulsivity, Risk-Taking, and Sensation-Seeking Scale**

The Impulsivity, Risk-Taking, and Sensation-Seeking Scale (IRTSSS) (Schafer et

al., 1994) is an 11-item questionnaire comprised of 3 subscales: impulsivity, risk-taking, and sensation-seeking. (see Appendix G). Participants are asked to record their responses according to a 4-point Likert scale ranging from 1 (not at all) to 4 (quite a lot). Example items include “In general, I enjoy the feeling of having an altered consciousness or state of mind” and “I get a real kick out of doing things that are a little dangerous”. One item was dropped to increase internal consistency, which was kept consistent in the current study, and a Cronbach's alpha for this measure has been reported of 0.87 (Eysenck, 1996).

## **2.6 Statistical analysis**

From the results collected of low and high risk athletes descriptive statistics were initially produced. For the inferential statistics independent samples t-tests were carried out for the following variables between low and high-risk groups. One-way for age, neuroticism, extraversion, agreeableness, conscientiousness, risk-taking, impulsivity and sensation seeking. Then Two-way for intellect, life orientation, achievement motives, task-oriented, distraction-oriented and disengagement-oriented. A chi-squared test for independence was carried out for the variable of sex as it compared two categorical variables.

# 3. Results

## 3.1. Participant Characteristics

The following descriptive statistics are provided in order to describe the two groups of athletes who participated in the current study and to build general psychological profiles of low- and high-risk athletes. A total of 216 participants took part in this study, including 110 (50.7%) high-risk athletes and 106 (48.8%) low-risk athletes. Descriptive statistics for demographic characteristics are summarised in Table 1. The mean age of the participants was 24.03 years (SD=6.55) with a range from 18 to 57 years. The mean average of years of participation in the sport was 7.18 years (SD=5.82) for low-risk athletes and 5.70 years (SD=5.74) for high-risk athletes.

Table 2 displays the number of participants in the sporting activities reported. The mode low-risk sport was rowing whilst the mode high-risk was skydiving.

**Table 2: Number of participants in each sport**

	N=(217)	%
<i>Low-risk sports:</i>		
Athletics	1	.5
Basketball	2	.9
Bowling	1	.5
Cycling	6	2.8
Dance	1	.5
G.A.A	1	.5
Golf	3	1.4
Rowing	39	18
Running	7	3.2
Skateboarding	1	.5
Soccer	4	1.8
Swimming	14	6.5
Table tennis	9	4.1
Tennis	10	4.6
Triathlons	3	1.4
Ultimate Frisbee	2	.9
Water polo	1	.5
<i>High-risk Sports:</i>		
Equestrian	1	

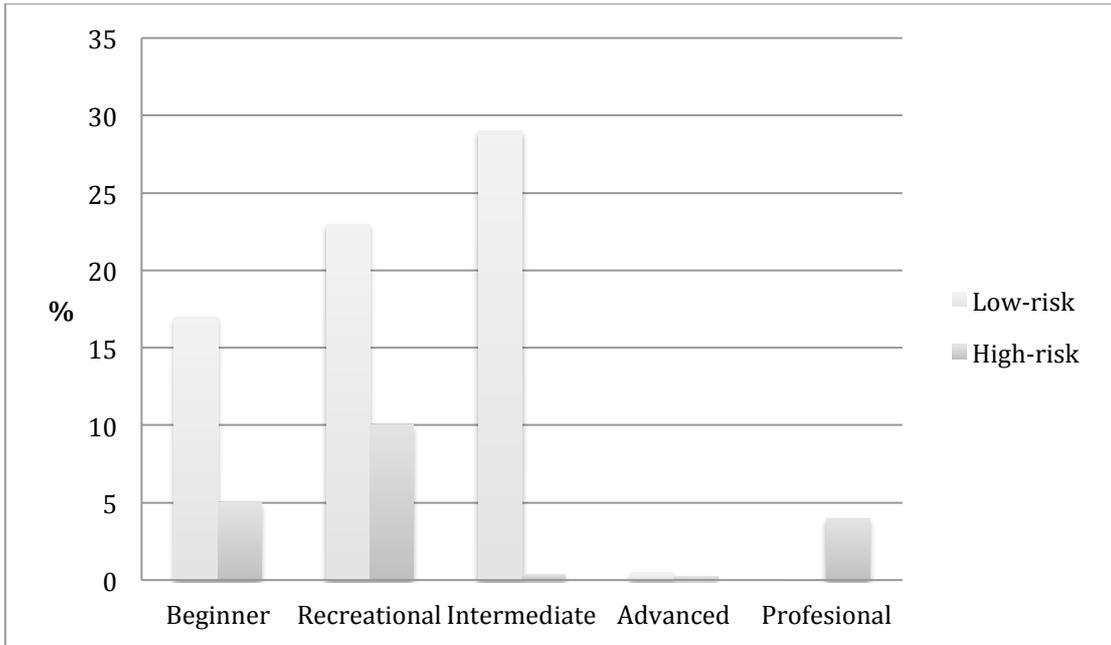
MMA	7	3.2
Motocross	19	8.8
Motorsport	10	4.6
Rugby	11	5.1
Skiing	2	.9
Skydiving	56	25.8
Snowboarding	4	1.8

Table 3 displays the mean scores and standard deviations of each measure used; they are displayed in the form of sample totals, and then grouped by level of risk taken by participant groups.

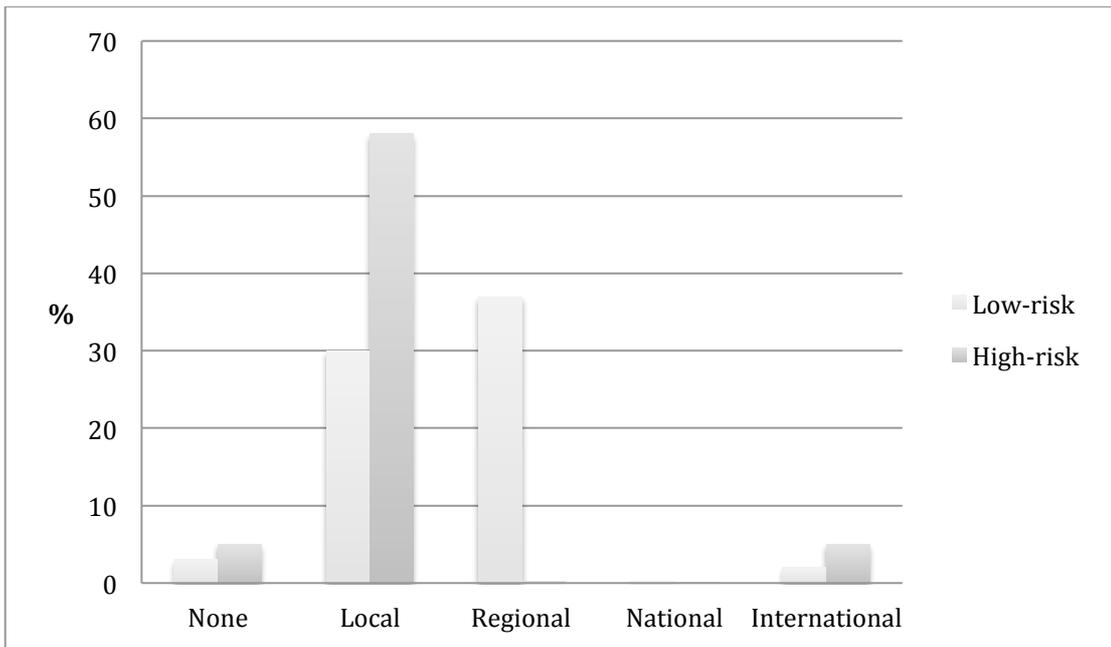
**Table 3: Levels of Risk in Relation to Personality, Mental Toughness, Achievement Motivation, Life Orientation, Coping, Impulsivity, Risk-Taking and Sensation-Seeking**

Scale	All (n=216)		Low-risk (n=106)		High-risk (n=110)		<i>t</i>
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	
<i>IPIP</i>							
Intellect	16.08	3.02	15.83	3.20	16.31	2.82	-.44
Neuroticism	10.08	3.29	9.83	3.33	10.23	3.23	-1.11
Conscientiousness	13.17	3.09	13.41	2.99	12.92	3.17	1.16
Agreeableness	14.17	3.22	14.31	3.36	14.02	3.10	.65
Extraversion	11.80	3.66	11.68	3.63	11.90	3.69	-1.14
<i>SMTQ</i>							
Control	9.21	2.86	9.67	3.03	8.76	2.62	2.35
Constancy	10.44	1.29	10.53	1.27	10.35	1.30	.99
Confidence	18.17	3.52	17.70	3.72	18.64	3.27	-1.97
<i>LOT—R</i>	14.87	4.40	14.75	4.72	14.97	4.09	-.36
<i>CICS</i>							
Disengagement	20.19	6.06	20.66	6.29	19.71	5.79	1.14
Task	86.24	14.48	85.01	15.27	87.49	13.59	-1.23
Distraction	17.68	6.30	18.00	6.29	17.36	6.39	.72
<i>IRTSSS:</i>							
Impulsivity	10.42	2.92	9.72	2.97	11.09	2.69	-3.54
Risk-taking	11.73	2.91	10.84	3.13	12.58	2.42	-4.56
Sensation-seeking	12.13	2.88	11.08	2.99	13.14	2.39	-5.58
<i>AMS—S</i>	19.59	16.41	17.39	18.10	21.71	14.37	-1.95

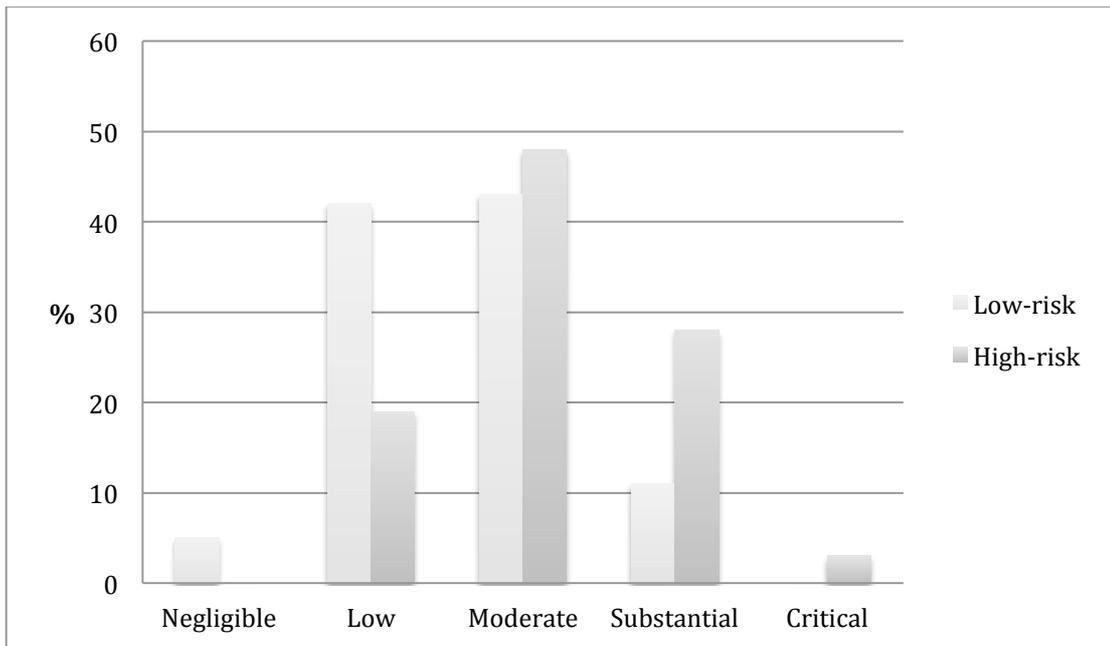
*t*= *t*-test for equality of means.



**Fig 1: Highest levels of participation.**



**Fig 2: Level of reported achievement.**



**Fig 3: Level of reported risk taken.**

### 3.2. Inferential Statistics

**3.2.1. Personality Traits** An independent samples t-test was conducted to compare neuroticism scores for high- and low-risk athletes. There was a significant difference in scores for low-risk athletes ( $M=9.83$ ,  $SD=3.33$ ) and high-risk athletes ( $M=10.33$ ,  $SD=3.23$ ;  $t(214) = -1.11$ ,  $p = .014$ , one-tailed). An independent samples t-test was conducted to compare extraversion scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=11.69$ ,  $SD=3.70$ ) and high-risk athletes ( $M=11.91$ ,  $SD=3.64$ ;  $t(214) = -.44$ ,  $p = 0.33$ , one-tailed). An independent samples t-test was conducted to compare agreeableness scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=14.31$ ,  $SD=3.36$ ) and high-risk athletes ( $M=14.02$ ,  $SD=3.10$ ;  $t(214) = .65$ ,  $p = 0.26$ , one-tailed). An independent samples t-test was conducted to compare conscientiousness scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=13.42$ ,  $SD=3.00$ ) and high-risk athletes ( $M=12.93$ ,  $SD=3.17$ ;  $t(214) = 1.16$ ,  $p = 0.125$ , one-

tailed). An independent samples t-test was conducted to compare intellect scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=15.83$ ,  $SD=3.20$ ) and high-risk athletes ( $M=16.30$ ,  $SD=2.83$ ;  $t(214) = -1.14$ ,  $p = 0.25$ , two-tailed). Neuroticism is therefore the only personality trait that significantly differed between low- and high-risk athletes. H2, which proposed that high-risk athletes will demonstrate significantly higher levels of neuroticism and extraversion and significantly lower levels of conscientiousness and acceptability as compared to low-risk athletes, is therefore partially rejected.

### **3.2.2. Mental Toughness**

To examine mental toughness, the sub-categories of confidence, constancy, and control were tested using three one-tailed t-tests for high- and low-risk athletes. There was a significant difference in confidence scores for low-risk athletes ( $M=17.69$ ,  $SD=3.72$ ) and high-risk athletes ( $M=18.64$ ,  $SD=3.27$ ;  $t(212) = -1.97$ ,  $p = 0.050$ , one-tailed). There was no significant difference in constancy scores for low-risk athletes ( $M=10.53$ ,  $SD=1.27$ ) and high-risk athletes ( $M=10.35$ ,  $SD=1.30$ ;  $t(214) = .99$ ,  $p = 0.165$ , one-tailed). There was a significant difference in control scores for low-risk athletes ( $M=9.67$ ,  $SD=3.04$ ) and high-risk athletes ( $M=8.76$ ,  $SD=2.62$ ;  $t(213) = 2.35$ ,  $p = 0.005$ , one-tailed). Confidence is therefore the only dimension that supports the hypothesis that athletes participating in high-risk sports will demonstrate significantly higher levels of mental toughness than will low-risk athletes, and H1 is therefore partially rejected.

### **3.2.3. Life Orientation**

An independent samples t-test was conducted to compare life orientation scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=14.76$ ,  $SD=4.72$ ) and high-risk athletes ( $M=14.97$ ,  $SD=4.09$ ;  $t$

(214) = .363,  $p = 0.72$ , two-tailed) in relation to optimism or pessimism, and H3, which proposed that high-risk athletes will report higher levels of optimism, is therefore rejected.

#### **3.2.4. Achievement Motivation**

An independent samples t-test was conducted to compare achievement motives scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=17.39$ ,  $SD=18.10$ ) and high-risk athletes ( $M=21.7$ ,  $SD=14.38$ ;  $t(214) = -1.95$ ,  $p = 0.053$ , two-tailed). H4, which proposed that high-risk athletes will report significantly higher levels of achievement motivation, is therefore rejected.

#### **3.2.5. Coping Strategies**

An independent samples t-test was conducted to compare task-orientated scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=85.01$ ,  $SD=15.27$ ) and high-risk athletes ( $M=87.49$ ,  $SD=13.59$ ;  $t(204) = -1.23$ ,  $p = 0.22$ , two-tailed). An independent samples t-test was conducted to compare distraction-orientated scores for high- and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=18.00$ ,  $SD=6.22$ ) and high-risk athletes ( $M=17.36$ ,  $SD=6.38$ ;  $t(206) = .72$ ,  $p = 0.47$ , two-tailed). An independent samples t-test was conducted to compare the disengagement-orientated scores for high-risk and low-risk athletes. There was no significant difference in scores for low-risk athletes ( $M=20.67$ ,  $SD=6.30$ ) and high-risk athletes ( $M=19.71$ ,  $SD=5.80$ ;  $t(208) = 1.14$ ,  $p = 0.255$ , two-tailed). H5, which proposed that high-risk athletes will score significantly higher in all levels of coping, is therefore rejected.

### **3.2.6. Risk-Taking, Impulsivity, and Sensation-Seeking**

An independent samples t-test was conducted to compare risk-taking scores for high- and low-risk athletes. There was a significant difference in scores for low-risk athletes ( $M=10.84$ ,  $SD=3.12$ ) and high-risk athletes ( $M=12.58$ ,  $SD=2.42$ ;  $t(214) = -4.544$ ,  $p = 0.0001$ , one-tailed). An independent samples t-test was conducted to compare impulsivity scores for high- and low-risk athletes. There was a significant difference in scores for low-risk athletes ( $M=9.73$ ,  $SD=2.97$ ) and high-risk athletes ( $M=11.09$ ,  $SD=2.69$ ;  $t(214) = -3.54$ ,  $p = 0.0005$ , one-tailed). An independent samples t-test was conducted to compare sensation-seeking scores for high- and low-risk athletes. There was a significant difference in scores for low-risk athletes ( $M=11.08$ ,  $SD=2.99$ ) and high-risk athletes ( $M=13.14$ ,  $SD=2.39$ ;  $t(214) = -5.58$ ,  $p = 0.0001$ , one-tailed).  $H_6$ , which proposed that high-risk athletes will demonstrate significantly higher levels of risk-taking and sensation-seeking than will low-risk athletes, is therefore accepted.

### **3.2.7. The Impact of Age and Gender on Risk Level**

An independent samples t-test was conducted to compare ages of high- and low-risk athletes. There was a significant difference in scores for low-risk athletes ( $M=22.87$ ,  $SD=5.68$ ) and high-risk athletes ( $M=25.15$ ,  $SD=7.13$ ;  $t(214) = -0.26$ ,  $p = 0.005$ , one-tailed). A Chi-square test for independence (with Yates Continuity Correction) indicated no significant association between sex and level of risk in participated sport ( $X^2[1, n=216] = 0.00$ ,  $p= 1$ ,  $\phi = -0.007$ ). Age was significantly lower in the low-risk group, while no significant difference was found in gender in relation to risk-level.  $H_7$ , which proposed that high-risk athletes are more likely to be younger or male, is therefore partially accepted.

## **4. Discussion**

The primary aim of this study was to build psychological profiles of high- and low-risk athletes by examining characteristics for which there is little consensus in the available literature. This study therefore assessed potential differences in personality traits, mental toughness, life orientation, motivation, coping, impulsivity, risk-taking and sensation seeking. This research was designed to provide additional insights into individual differences and personality characteristics in a sports psychology context in order to augment the existing literature available on athletes who participate in high- and low-risk sporting activities.

### **4.1. Summary of Findings**

Significant associations between seven of the eighteen measured psychological dimensions were found; neuroticism, confidence, control, risk-taking, impulsivity, sensation-seeking, and younger age were each found to be significantly positively correlated with high-risk sport participation. There were no significant differences reported for the other eleven constructs measured.

The results of this study show that levels of neuroticism are the biggest predictor of participation in high-risk sports, contradicting the research findings that consistently found high-risk athletes to be much more emotionally stable than low-risk Athletes (Breivik et al., 1999; Goma-i-Freixanet et al., 1991). Low levels of neuroticism suggest an increased ability to adapt to an environment, remain calm in situations involving risk, and deal with stress optimistically. High-risk athletes were expected to be more extraverted, consistent with research carried out by Kajtna et al. (2004); our non-significant results can neither support nor contradict this. Assessing the

dimension of agreeableness, no significant difference was reported, adding additional support to the existing research, which reports no associations between risk-taking in sport and pro-social personalities or social recognition (Eisenberg, 1992). Similarly, non-significant differences in conscientiousness were found, and this study is therefore unable to build on the research of Goma-i-Freixanet (1991), who found that high-risk athletes were more likely to be orderly, persistent, hardworking, determined, and restless at completion. Intellect differences were also non-significant, limiting the expansion of findings by Kajtna et al. (2004) reporting intellect to be associated with low-risk sports participation.

Interestingly, high-risk athletes reported higher levels of mental toughness, showing greater levels of confidence with lower levels of control. Consistent with the hypothesis, confidence and control levels were significantly higher in the high-risk group. Contrastingly, levels of constancy were not significantly related to participation in high-risk sports. It is interesting to consider these findings in relation to the work of Bull et al. (2005), who found that levels the elements of mental toughness are stronger in high-risk athletes.

There was also no association between optimism levels 0 and high-risk sports participation, resulting in rejection of the hypothesis that high-risk athletes would score higher. This study was therefore unable to support the work of Dillard et al. (2006), who found that high levels of optimism were associated with rationalizing beliefs of potentially harmful risk-taking behaviours. Likewise, no significant results were found in relation to levels of achievement motivation in high-risk athletes, and this study was therefore also unable to replicate the findings of Slanger

(1997), who reported that 85% of high-risk athletes studied identified a desire for mastery as a motivator. Instead, this study found that levels of achievement motives of both groups of athletes were similar.

Coping strategies of high-risk participants were found to not significantly differ from the strategies of low-risk participants over all three sub-domains of task-oriented, distraction-oriented, and disengagement-oriented coping, despite the available research, which suggests that there are significant differences in relation to high-risk athletes coping with injury (Junge et al., 2000), and therefore it would be expected that the management of internal and external demands of specific stress-inducing situations (Lazarus & Folkman, 1984) would be higher amongst high-risk athletes. This study does not support these hypotheses.

In this study, high-risk athletes were found to be more impulsive, more sensation-seeking, and bigger risk-takers. These results are consistent with the findings of Straub (1982) and Wagner & Houlihan (1994), who found that levels of impulsivity and sensation-seeking are consistently higher among high-risk athletes.

Age was found to be a significant predictor variable of risk-taking in sport, high-risk athletes were found to be significantly older, contradicting literature into the area of age related to risk, as low-risk athletes are generally reported to be younger. This finding contradicts the suggestion that risk taken decreases as age increases (Gardner et al., 2005). As well as the findings filling the gap that exists in research regarding age of participants in high-risk sport (Feher et al., 1998). A greater likelihood of high-risk athletes being male was not found in this sample. These

findings therefore do not support the long-held assumption that males are risk-takers and females are risk-avoiders (Hannah-Moffat & O'Malley, 2007). However, because the sample was predominantly male and therefore may have lacked sufficient power to allow for an accurate gender analysis, these findings should be considered preliminary and inconclusive.

#### **4.2. Strengths and Limitations of the Study**

This study had several limitations. Some of these limitations were predictable given the nature of using an online questionnaire battery to gather psychological data. It was not possible to provide consistent environmental conditions for participants; for example, some participants may have completed the battery in laboratory conditions, while others may have completed the battery while watching television. There may also have been significant variation in the amount of time and effort each participant spent on completion of the battery, and future studies would benefit from electronically measuring completion time. It was likewise not possible to verify whether each participant actually participated in the sport indicated or to check the veracity of any other demographic variable recorded. Participants were also required to use their own potentially subjective judgment as to achievement level without reference to objective standards, and some degree of self-report bias should therefore be assumed. Future studies would benefit from using more objective standards of achievement level. The sample also consisted of a disproportionate number of participants originating in the United States and identifying as male, rendering the statistically insignificant influence of gender on risk-level, for example, potentially inconclusive. The online format of the questionnaire battery also limited access to those participants who use the forums and websites in which

it was posted, preventing participation of athletes who do not frequent such forums and websites, and introducing potential self-selection bias. Another possible limitation was in the large age range, from 18 to 57. Although this allowed examination of the age hypothesis, it is important to note that the groups were not equally represented, possibly leading to variation in results. Another potential limitation of the current study is the sample size, which may have resulted in insufficient power. Future studies would therefore benefit from larger samples. The next limitation was due to the nature of the multiple hypotheses tested, which included a total of eighteen sub hypotheses. A family-wise or type 1 error may have occurred, resulting in false reading of the data analysis. The personality scale that was used, for example, was a short measure of the Big Five traits, designed specifically for situations where longer measures cannot be used. This measure cannot be used as a replacement for longer measures, however, meaning that the interpretation of results could vary in relation to the full scale, and null results should be interpreted with caution. The study also offered no financial or other incentive for to participants, potentially resulting in less time and attention committed during completion of the study. Social desirability bias, where a respondent wants to look good and tries to give desirable answers, is also a possible limitation to the current study. Finally, it is possible that data contamination occurred. The athletes were not screened to determine whether they took part in more than one sport, so it is possible that they participated in more than one high-risk sport or in a low-risk sport in addition to an extreme one.

However, this study also had several strengths. The free online availability of the questionnaire battery also allowed access for participants from all over the world,

and participants from a total of 21 countries were therefore included. It is rare in psychology studies for a sample to be this international; although not investigated in this study, there is an opportunity for future studies to examine cross-cultural and nationality influences on the various personality characteristics examined in this research. Results were not controlled for nationality; given the small sample size and the uneven distribution of participants, there is an opportunity to measure such effects in future research. Online availability also allowed for a larger sample size and a range of ages, education levels, and levels of experience in the sport. Some of the selected sports samples had very few ( $n < 2$ ) participants, such as athletics, bowling, equestrian, and skateboarding, and this showed little variation within the sample population.

#### **4.3. Implications and Possible Applications**

The results of this study indicate that there are significant differences in personality characteristics between low- and high-risk athletes. Additional research in this area may lead to more appropriate and efficient

#### **4.4. Future Research Directions**

Future research for this study can be separated into the areas of neuropsychology, clinical applications, and arousal regulation. These appear to be areas of psychology that are lacking in the research field of this study.

In the field of neuropsychology imaging of brains has found that a positive correlation exists between high levels of mental toughness and more grey matter tissue in one's right frontal lobe. (Clough et al., 2010). It may be likely something similar exists in regard to level of risk taking in athletes.

Clinical implications from this study could lead to better understanding of the characteristics of certain athletes, allowing for diverse and directed practices of intervention. For areas like mental toughness, a skill that is learned through experience, scenarios could be fabricated to replicate this.

The implications these findings could assist coaching in a broad range of manners, a better understanding of who the athletes are being coached, will always benefit to the methods and practices used, to enable athletes to perform to the highest ability. Arousal regulation and the flow experience could be expanded on through this, are athletes sharing consistent levels of concepts with high-risk sports in line with athletes that report high levels of arousal regulation.

In addition to these suggestions regarding future direction, qualitative more objective studies might add insight to areas of unclear direction of risk level taken with regard to various athletes.

#### **4.5. Conclusion**

Consistently with choice regarding behaviour, how an individual chooses what sport to participate in, is an extremely complex and involves many more concepts than examined in the current study. The aim of this study was to overall add to the literature in the area of personality in risk of sporting activities. Consisting of supporting and contradicting findings, key differences were high-risk athletes were higher in levels of age, neuroticism, confidence, risk-taking and sensation seeking. Analysis displayed low-risk athletes scored higher in levels of control, distraction-oriented and disengagement-orientated. Findings for optimism, achievement motives, constancy, agreeableness, conscientiousness, intellect and task-oriented

were all found to be non-significant, suggesting no differences among these concepts in relation to risk level of sport. Over all this is only a drop in the ocean to developing well accepted theories and law of human behaviour in relation to specific sporting activities, this study was a small step in that direction.

# References

- Andersson, G. (1996). The benefits of optimism: a meta-analytic review of the Life Orientation Test. *Personality and Individual Differences*, 21(5), 719-725.
- Beal, D. J., Weiss, H. M., Barros, E., & MacDermid, S. M. (2005). An episodic process model of affective influences on performance. *Journal of Applied Psychology*, 90(6), 1054.
- Bull, S. J., Shambrook, C. J., James, W., & Brooks, J. E. (2005). Towards an understanding of mental toughness in elite English cricketers. *Journal of Applied Sport Psychology*, 17(3), 209-227.
- Breivik, G. (1995). *Personality, sensation seeking and arousal in high risk sports*. Oslo: Norwegian University of Sport and Physical Education.
- Cary, T. (2014). Competitors in the Isle of Man TT know death is just a split second away. *The Telegraph*. Retrieved from <http://www.telegraph.co.uk/>
- Castanier, C., Scanff, C. L., & Woodman, T. (2010). Who takes risks in high-risk sports? A typological personality approach. *ResearchQ for Exercise and Sport*, 81(4), 478-484.
- Connaughton, D., Wadey, R., Hanton, S., Jones, G. (2008). The development and maintenance of mental toughness: perceptions of elite performers. *Journal of Sports Sciences*, 26: 83–95.
- Cooper, A. J., Smillie, L. D., & Corr, P. J. (2010). A confirmatory factor analysis of the Mini-IPIP five-factor model personality scale. *Personality and Individual Differences*, 48(5), 688-691.
- Crocker, P. R. (1992). Managing stress by competitive athletes: ways of coping. *International Journal of Sport Psychology*.

- Crust, L., & Clough, P. J. (2011). Developing mental toughness: from research to practice. *Journal of Sport Psychology in Action*, 2(1), 21-32.
- Crust, L., & Clough, P. J. (2005). Relationship between mental toughness and physical endurance 1. *Perceptual and Motor Skills*, 100(1), 192-194.
- Dale, G. A. (1996). Existential phenomenology: emphasizing the experience of the athlete in sport psychology research. *Sport Psychologist*, 10(4), 307-321.
- Dillard, A. J., McCaul, K. D., Klein, W. M. P. (2006). Unrealistic optimism in smokers: Implications for smoking myth endorsement and self-protective motivation. *Journal of Health Communication: International Perspectives*, 11(1), 93-102.
- Donnellan, M. B., Oswald, F. L., Baird, B. M., & Lucas, R. E. (2006). The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment*, 18, 192-203.
- Douglas, M. (1986). *Risk acceptability according to the social sciences* (Vol. 11). Russell Sage Foundation.
- Elbe, A. M. (2002). Achievement Motives Scale--Sport [Database record]. Retrieved from PsycTESTS. doi: 10.1037/t10556-000.
- Feher, P., Meyers, M. C., & Skelly, W. A. (1998). Psychological profile of rock climbers: state and trait attributes. *Journal of Sport Behavior*, 21(2), 167-180.
- Fourie, S., & Potgieter, J. R. (2001). The nature of mental toughness in sport. *South African Journal for Research in Sport, Physical Education and Recreation*, 23(2), 63.

- Gaudreau, P., & Blondin, J. P. (2004). Different athletes cope differently during a sport competition: a cluster analysis of coping. *Personality and Individual Differences*, 36(8), 1865-1877.
- Gaudreau, P., Nicholls, A., & Levy, A. R. (2010). The ups and downs of coping and sport achievement: an episodic process analysis of within-person associations. *Journal of Sport & Exercise Psychology*, 32(3), 298.
- Gaudreau, P., & Blondin, J. P. (2004). Differential associations of dispositional optimism and pessimism with coping, goal attainment, and emotional adjustment during sport competition. *International Journal of Stress Management*, 11(3), 245.
- Gardner, M., & Steinberg, L. (2005). Peer influence on risk taking, risk preference, and risky decision making in adolescence and adulthood: an experimental study. *Developmental Psychology*, 41(4), 625.
- Geers, A. L., Wellman, J. A., Lassiter G. D. (2009). Dispositional optimism and engagement: the moderating influence of goal prioritization. *Journal of Personality and Social Psychology*, 96(4):913–32.
- Goleman, D. (1998). Working with emotional intelligence. New York: Bantam.
- Goma-i-Freixanet, M. (1991). Personality profile of subjects engaged in high physical risk sports. *Personality and Individual Differences*, 12(10), 1087-1093.
- Gould, D., Jackson, S. A., & Finch, L. M. (1993). Life at the top: the experiences of US national champion figure skaters. *The Sport Psychologist*.
- Grove, R. J. & Heard, P. N. (1997). Optimism and sport confidence as correlates of slump-related coping among athletes. *The Sport Psychologist*, 11, 400-410.

- Harackiewicz, J. M., Barron, K. E., Carter, S. M., Lehto, A. T., & Elliot, A. J. (1997). Predictors and consequences of achievement goals in the college classroom: maintaining interest and making the grade. *Journal of Personality and Social Psychology*, 73(6), 1284.
- Harris, C. R., Jenkins, M. & Glaser, D. (2006). Gender differences in risk assessment: why do women take fewer risks than men? *Judgment and Decision Making*, 1(1), 48–63.
- Henderson, V. R., Hennessy, M., Barrett, D. W., Curtis, B., McCoy-Roth, M., Trentacoste, N., & Fishbein, M. (2005). When risky is attractive: sensation seeking and romantic partner selection. *Personality and Individual Differences*, 38(2), 311-325.
- Hirsch, J. K., Britton, P. C., & Conner, K. R. (2010). Psychometric evaluation of the life orientation test—revised in treated opiate dependent individuals. *International Journal of Mental Health and Addiction*, 8(3), 423-431.
- Hoar, S. D., Kowalski, K. C., Gaudreau, P., & Crocker, P. R. (2006). A review of coping in sport. *Literature Reviews in Sport Psychology*, ISSUE?? 47-90.
- Huberman, J. (1968). Psychological study of participants in high-risk sports. JOURNAL ISSUE PAGES
- Jack, S. J., & Ronan, K. R. (1998). Sensation seeking among high-and low-risk sports participants. *Personality and Individual Differences*, 25(6), 1063-1083.
- Junge, A. (2000). The influence of psychological factors on sports injuries review of the literature. *The American Journal of Sports Medicine*, 28(suppl 5), S-10.

- Kaiseler, M., Polman, R., & Nicholls, A. (2009). Mental toughness, stress, stress appraisal, coping and coping effectiveness in sport. *Personality and Individual Differences*, 47(7), 728-733.
- Krane, V., & Williams, J. (1987). Performance and somatic anxiety, cognitive anxiety, and confidence changes prior to competition. *Journal of Sport Behavior*, 10(1), 47-56.
- Kajtana, T., Tušak, M., Barić, R., & Burnik, S. (2004). Personality in high-risk sports athletes. *Kinesiology*, 36(1), 24-34.
- Kaiseler, M., Polman, R., & Nicholls, A. (2009). Mental toughness, stress, stress appraisal, coping and coping effectiveness in sport. *Personality and Individual Differences*, 47(7), 728-733.
- Lazarus, R. S., & Folkman, S. (1984). Stress. *Appraisal and Coping*, 725. ISSUE??
- Levy, A. R., Polman, R. C., Clough, P. J., Marchant, D. C., & Earle, K. (2006). Mental toughness as a determinant of beliefs, pain, and adherence in sport injury rehabilitation. *Journal of Sport Rehabilitation*, 15(3), 246-254.
- Levy, J. S. (1997). Prospect theory, rational choice, and international relations. *International Studies Quarterly*, 41(1), 87-112.
- Little, H. (2006). Children's risk-taking behaviour: implications for early childhood policy and practice. *International Journal of Early Years Education*, 14(2), 141-154.
- Lyng, S. (1990). Edgework: a social psychological analysis of voluntary risk taking. *American Journal of Sociology*, ISSUE?? 851-886.
- Madrzycki T. (1996) Personality as a system for creating and implementing the plans. Gdańsk: GWP.
- Mather, M., Godlick, M. A., Mazar, M., Lighthall, N. A., Burgeno, J. &

- Shoemaker, A. (2012). Risk preferences and aging: the “Certainty Effect” in older adults’ decision making. *Psychology and Aging, 27*(4), 801– 816
- Murray, D. M. (2003). Living on the edge: sensation seeking and extreme sports participation. JOURNAL ISSUE PAGES??
- Nes, L. S., & Segerstrom, S. C. (2006). Dispositional optimism and coping: a meta-analytic review. *Personality and Social Psychology Review, 10*(3), 235-251.
- Nicholls, A. R., & Polman, R. C. (2007). Coping in sport: a systematic review. *Journal of Sports Sciences, 25*(1), 11-31.
- Nicholson, N., Soane, E., Fenton-O’Creevy, M., & Willman, P. (2005). Personality and domain-specific risk taking. *Journal of Risk Research, 8*(2), 157-176.
- Palmer, C. (2002). “Shit happens”: the selling of risk in extreme sport. *The Australian Journal of Anthropology, 13*(3), 323-336.
- Paulus, M. P., Flagan, T., Simmons, A. N., Gillis, K., Kotturi, S., Thom, N., ... Swain, J. L. (2012). Subjecting elite athletes to inspiratory breathing load reveals behavioral and neural signatures of optimal performers in extreme environments. *PLoS One, 7*(1), e29394.
- Rosen, R. (2013). What Is Reddit? Retrieved January 28, 2015, from <http://www.theatlantic.com/technology/archive/2013/09/what-is-reddit/279579/>
- Ryan, R.M. & Deci, E.L. (2000). Intrinsic and extrinsic motivations: classic definitions and new directions. *Contemporary Educational Psychology, 25*, 54–67.

- Sakamoto, S., & Tanaka, E. (2002). A study of the Japanese version of revised Life Orientation Test. *Japanese Journal of Health Psychology*. ISSUE PAGES??
- Schafer, J., Blanchard, L., & Fals-Stewart, W. (1994). Impulsivity, Risk-Taking, and Sensation-Seeking Scale [Database record]. Retrieved from PsycTESTS. doi: 10.1037/t04888-000.
- Selosse, J. (1998). Conduite de risque. R. Doron et F. Parot, *Dictionnaire de Psychologie, Paris: PUF*.
- Shoham, A., Rose, M. G., & Kahle, R. L. (2000). Practitioners of risky sports: a quantitative examination. *Journal of Business Research*, 47, 237-251.
- Skinner, E. A., Edge, K., Altman, J., & Sherwood, H. (2003). Searching for the structure of coping: a review and critique of category systems for classifying ways of coping. *Psychological Bulletin*, 129(2), 216.
- Slanger, E., & Rudestam, K. E. (1997). Motivation and disinhibition in high risk sports: sensation seeking and self-efficacy. *Journal of Research in Personality*, 31(3), 355-374.
- Stelmack, R. M. (Ed.). (2004). *On the psychobiology of personality: essays in honor of Marvin Zuckerman*. Elsevier.
- Straub, W. F. (1982). Sensation seeking among high and low-risk male athletes. *Journal of Sport Psychology*. ISSUE PAGES
- Turner, C., McClure, R., & Pirozzo, S. (2004). Injury and risk-taking behavior—a systematic review. *Accident Analysis & Prevention*, 36(1), 93-101.
- Rabideau, S. T. (2005). Effects of achievement motivation on behavior. *Personality Research ISSUE PAGES*

- Willig, C. (2008). A phenomenological investigation of the experience of taking part in 'extreme sports'. *Journal of Health Psychology*, 13(5), 690–702.
- YSSA. (2014). Youth Sports Safety Statistics. Retrieved March 27 2015 from <http://www.youthsportssafetyalliance.org/sites/default/files/docs/Statistics-2013.pdf>
- Vollrath, M., Knoch, D., & Cassano, L. (1999). Personality, risky health behaviour, and perceived susceptibility to health risks. *European Journal of Personality*, 13(1), 39-50.
- Vollrath, M., & Torgersen, S. (2002). Who takes health risks? A probe into eight personality types. *Personality and Individual Differences*, 32(7),1185-1197.
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. Cambridge university press.

# Appendix

## **A: Questionnaire introduction:**

You are being invited to participate in a research study. Thank you for taking time to read this information leaflet.

STUDY TITLE: What makes a High-Risk Athlete? A Quantitative study of the Individual Differences of High and Low Risk Athletes.

### WHAT ARE THE OBJECTIVES OF THIS STUDY?

The aim of the study is to assess the personality characteristics of athletes participating in High and low risk sporting activities.

The specific objectives include:

- a) Understanding athletes personality trends in relation to type of sporting activity.
- b) Establish if any differences exist between the two groups of high and low risk athletes.

### WHY HAVE I BEEN CHOSEN?

You have been approached to participate in this research as you participate in a sporting activity.

### WHAT WILL HAPPEN IF I VOLUNTEER?

Your participation is entirely voluntary. If you initially decide to take part you can subsequently change your mind and withdraw from the study without difficulty.

If you agree to participate you will be requested to take complete this Questionnaire.

### RIGHT TO WITHDRAW

If you do decide to withdraw from the study, you can request to have your questionnaire data removed from the study until the 28/1/2015.

### ARE THERE ANY BENEFITS FROM MY PARTICIPATION?

While there will be no direct benefit from participation but the study will make an important contribution to our understanding of the personality characteristics attributed towards certain types of sports. As such, the findings from this study will be presented within the college. Interim and final reports will also be prepared. However no individual participant will be identified in any publication or presentation.

Individuals will not be offered any monetary or other rewards for their participation.

### ARE THERE ANY RISKS INVOLVED IN PARTICIPATING?

There are no risks associated with participation. Any inconvenience involved in taking part will be limited.

### WHAT HAPPENS IF I DO NOT AGREE TO PARTICIPATE?

If you decide not to participate your decision will be respected.

## CONFIDENTIALITY

All individual information collected as part of the study will remain confidential to the research team. You will be asked to create a unique identity code on this questionnaire. Only the researcher and supervisor will have access to this information. All unique identity codes will be recoded in order to de-identify data and these codes will be stored in an encrypted file. De-identified electronic data will be held for a period of 7 years and then deleted.

## CONTACT DETAILS

If you have any further questions about the research or if you wish for updates you can contact:

Researcher: Oran O'Kelly (oran.okelly@student.ncirl.ie)

Supervisor: Dr. Arlene Egan (01-4498694; Arlene.egan@ncirl.ie )

## **B: Mini IPIP**

Instructions: On the following pages, there are phrases describing people's behaviors. Please use the rating scale below to describe how accurately each statement describes you. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. So that you can describe yourself in an honest manner, your responses will be kept in absolute confidence. Please read each statement carefully, and then fill in the bubble that corresponds to the number on the scale.

**1=Very Inaccurate**

**2=Moderately Inaccurate**

**3=Neither Inaccurate nor Accurate**

**4=Moderately Accurate**

**5=Very Accurate**

1. Am the life of the party (E)
2. Sympathize with others' feelings (A)
3. Get chores done right away (C)
4. Have frequent mood swings (N)
5. Have a vivid imagination (I)
6. Don't talk a lot (E)
7. Am not interested in other people's problems (A)
8. Often forget to put things back in their proper place (C)
9. Am relaxed most of the time (N)
10. Am not interested in abstract ideas (I)
11. Talk to a lot of different people at parties (E)
12. Feel others' emotions (A)
13. Like order (C)
14. Get upset easily (N)

- 15. Have difficulty understanding abstract ideas (I)
- 16. Keep in the background (E)
- 17. Am not really interested in others (A)
- 18. Make a mess of things (C)
- 19. Seldom feel blue (N)
- 20. Do not have a good imagination (I)

Note: Items 6, 7, 8, 9, 10, 15, 16, 17, 18, 19, and 20 are reverse scored.

### **C: Sports Mental Toughness Questionnaire:**

#### Confidence

- 13. I interpret potential threats as positive opportunities.
- 5. I have an unshakeable confidence in my ability.
- 11. I have qualities that set me apart from other competitors.
- 6. I have what it takes to perform well while under pressure.
- 14. Under pressure, I am able to make decisions with confidence and commitment.
- 1. I can regain my composure if I have momentarily lost it.

#### Constancy

- 3. I am committed to completing the tasks I have to do.
- 12. I take responsibility for setting myself challenging targets.
- 8. I give up in difficult situations.
- 10. I get distracted easily and lose my concentration.

#### Control

- 2. I worry about performing poorly.
- 4. I am overcome by self-doubt.
- 9. I get anxious by events I did not expect or cannot control.
- 7. I get angry and frustrated when things do not go my way.

### **D: Achievement Motives:**

3 = exactly true for me 2 = mostly true for me 1 = less true for me 0 = not true for me at all

1. I notice that my interest is quickly stimulated by athletic challenges that I cannot master immediately.
2. When confronted with an athletic challenge that I can possibly accomplish, I am immediately eager to meet it.
3. I like to succeed in the athletic activities I participate in.
4. I am attracted to athletic activities which allow me to test my abilities.
5. I enjoy those athletic activities about which I am uncertain as to whether or not I can accomplish them.
6. When confronted with an athletic activity about which I am uncertain as to whether I can succeed in it, I want to attempt it immediately.
7. I enjoy athletic situations in which I can demonstrate my athletic abilities.
8. I like being confronted with a difficult athletic task.
9. I like athletic situations in which I can see how good I am.
10. I like trying new and unknown tasks in sport, even if my attempts do not work out right away.
11. It is important for me to succeed in sport tasks that I can actually accomplish.
12. I am attracted to athletic situations in which I can test my abilities.
13. I enjoy athletic tasks that are slightly difficult for me.
14. Sport tasks that are slightly difficult to master appeal to me.
15. I like learning new things in sport even if they are not part of my regular sport activities.
16. I do not like to practice something in sports if I am not sure that I can accomplish it.
17. I do not like athletic situations in which my abilities are tested.
18. When faced with a difficult athletic task, I hope that I do not have to do it because I am afraid of not succeeding in it.
19. I become anxious when I cannot meet the demands of an athletic task immediately.

20. I prefer to avoid athletic situations in which I can apply my skills.
21. I find it unsettling to do something in sport, when I am not sure I can accomplish it.
22. I feel pretty afraid undertaking new athletic activities even when no one is watching.
23. I fear athletic activities that I cannot succeed in, even when no one will notice my failure.
24. I am even afraid of failing at athletic challenges that I believe I can accomplish.
25. When I have been unsuccessful in an athletic activity, I am ashamed even when no one raises the issue with me.
26. I am afraid of failing in challenging athletic activities in which a lot depends on my performance.
27. I am uncomfortable with performing athletic activities in which I have to prove my athletic abilities.
28. Just contemplating a new and unknown athletic challenge makes me somewhat anxious.
29. I do not enjoy undertaking athletic tasks when I am uncertain that I will succeed.
30. Demanding athletic activities that are somewhat difficult unsettle me.

### **E: Coping strategies in sports**

Likert-type scale ranging from 1 (not used at all) to 5 (used very much).

#### Thought control

- (19). I tried not to be intimidated by other athletes.
- (45). I tried to block out my doubts by thinking positively.
- (58). I replaced my negative thoughts by positive ones.
- (89). I tried not to think about my mistakes.

#### Mental imagery

- (6). I visualized that I was in total control of the situation.
- (35). I mentally rehearsed the execution of my movements.

(42). I imagined that I was doing a good performance.

(86). I visualized my all-time best performance.

#### Relaxation (relaxation)

(4). I tried to relax my body.

(11). I tried to reduce the tension in my muscles.

(22). I did some relaxation exercises.

(36). I relaxed my muscles.

#### Effort expenditure

(7). I applied myself by giving a consistent effort.

(50). I gave a relentless effort.

(92). I gave my best effort.

(48). I analyzed my past performances.

(66). I tried to find solutions in order to manage the situation.

(74). I analyzed the weaknesses of my opponents.

(82). I analyzed the demands of the competition.

#### Seeking support

(16). I asked someone for advice concerning my mental preparation.

(67). I asked other athletes for advice.

(78). I talked to a trustworthy person.

(91). I talked to someone who is able to motivate me.

#### Venting of unpleasant emotion

(25). I used swear-words loudly or in my head in order to vent my anger

(43). I expressed my discontent.

(64). I got angry.

(73). I expressed my frustrations.

#### Mental distraction

(46). I occupied my mind in order to think about other things than the competition.

(59). I thought about my favorite leisure in order not to think about the competition.

(70). I entertained myself in order not to think about the competition.

(72). I thought about my family or about my friends to distract my mind.

#### Disengagement/resignation

(10). I let myself feel hopeless and discouraged

(39). I wished that the competition would end immediately.

(60). I stopped believing in my ability to reach my goal.

(93). I lost all hope of attaining my goal.

#### Social withdrawal

(3). I took my distance from other athletes.

(49). I retreated where it was easy to think.

(81). I searched for calmness and quietness.

(83). I kept all people at a distance.

### **F: Life orientation test**

#### **Items:**

1. In uncertain times, I usually expect the best.

2. It's easy for me to relax. (Filler item)

3. If something can go wrong for me, it will.<sup>a</sup>

4. I'm always optimistic about my future.

5. I enjoy my friends a lot. (Filler item)

6. It's important for me to keep busy. (Filler item)

7. I hardly ever expect things to go my way.<sup>a</sup>

8. I don't get upset too easily. (Filler item)

9. I rarely count on good things happening to me.<sup>a</sup>

10. Overall, I expect more good things to happen to me than bad.

**G: Impulsivity, risk-taking and sensation seeking**

scale ranging from not at all (1) to quite a lot (4).

Items:

I often act on the spur-of-the-moment without stopping to think.

I get a real kick out of doing things that are a little dangerous.

You might say I act impulsively.

I like to test myself every now and then by doing something a little chancey.

Many of my actions seem to be hasty.

I'm always up for a new experience.

I like the feeling of being giddy or woozy.

I like to try new things just for excitement.

I go for the thrills in life when I get a chance.

I like to experience new and different sensations.

In general, I enjoy the feeling of having an altered consciousness or state of mind.